Injury Surveillance & Prevention Among Soldiers

Activities at the U.S. Army Center for Health Promotion and Preventive Medicine

By

Dr. Bruce Jones

November 19, 2003

Mission

Create an integrated AMEDD injury prevention program that leads, facilitates and supports Army and Command injury prevention efforts through surveillance, evidence based program recommendations, rigorous evaluation and routine collaboration.

Systematic Prevention of Injuries Requires Answers to Five Questions

- Is there a problem? How big is it?
- What causes the problem?
- What works to prevent the problem?
- Who needs to know and act?
- How effective is what we are doing?

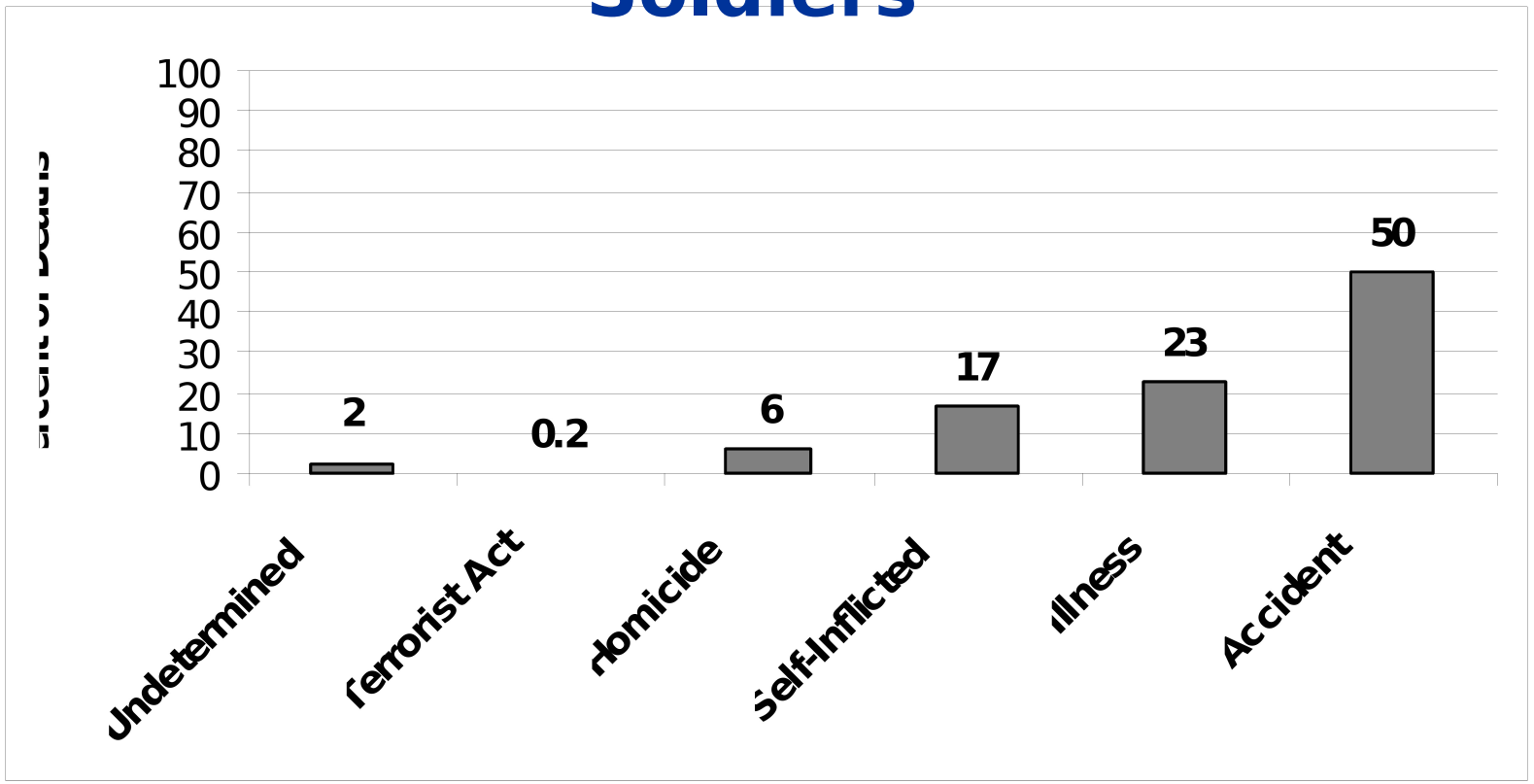
Four Steps of Public Health Approach to Injury Prevention

1. **Surveillance** – Identifies & prioritizes problems
2. **Research**
   - **Epidemiology - Finds causes and risk factors**
   - **Intervention Trials – Determine what works**
3. **Program and Policy Implementation** – Ensures action for prevention
4. **Evaluation** – Determines effectiveness

USACHPPM Surveillance Activities

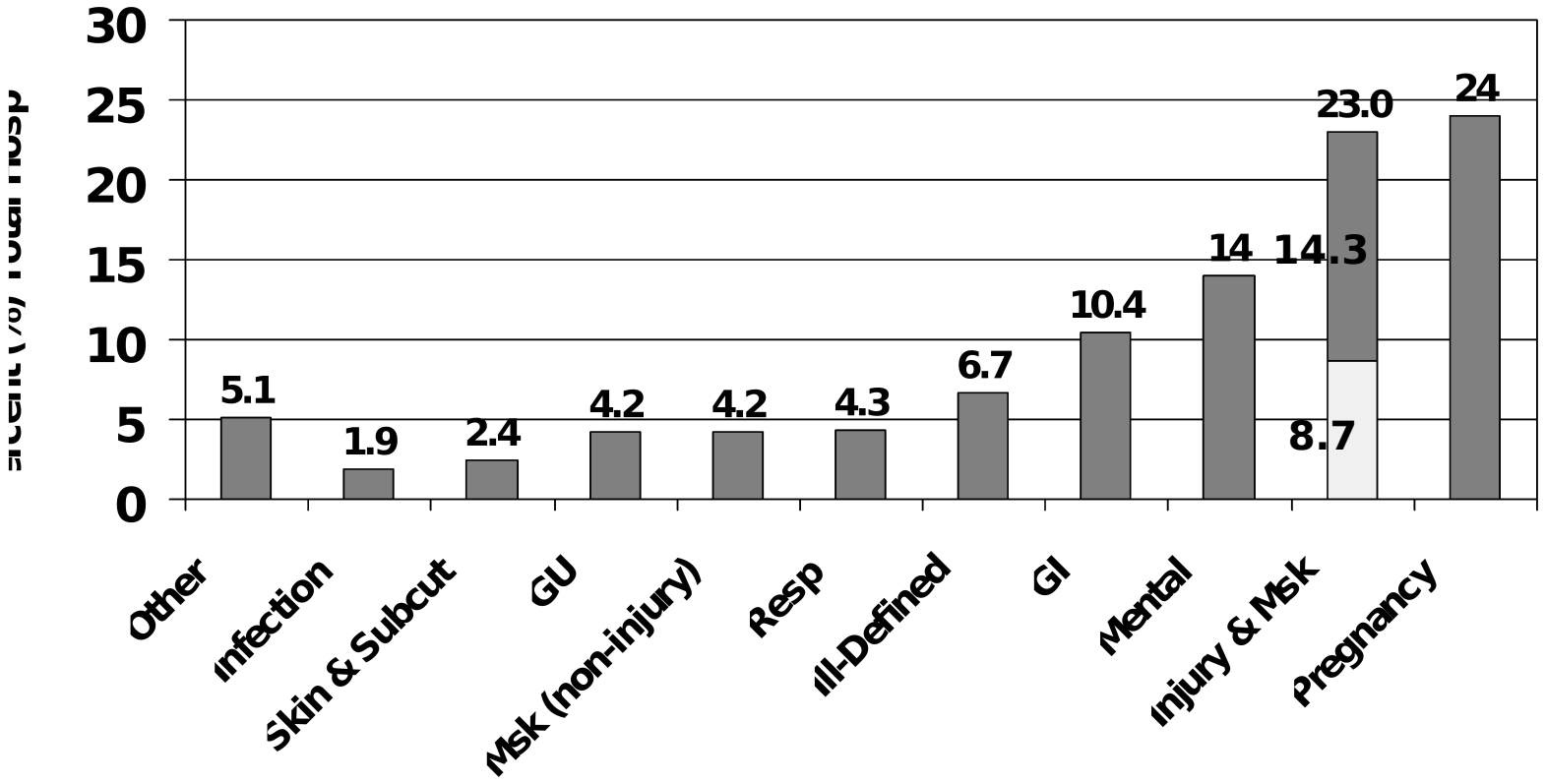
- Medical surveillance tracking incidence and causes of injuries & high risk populations
  - Army Medical Surveillance Activity (AMSA)
    - DOD Executive Agent for Defense Medical Surveillance System (DMSS)
    - Defense Medical Epidemiological Database (DMED)
    - Installation Injury Report http://amsa.army.mil/
    - Training-related Injury Report (TRIR) monthly report on 5 BCT sites.

Importance of Injuries vs. Illnesses as a Cause of Death Among Soldiers



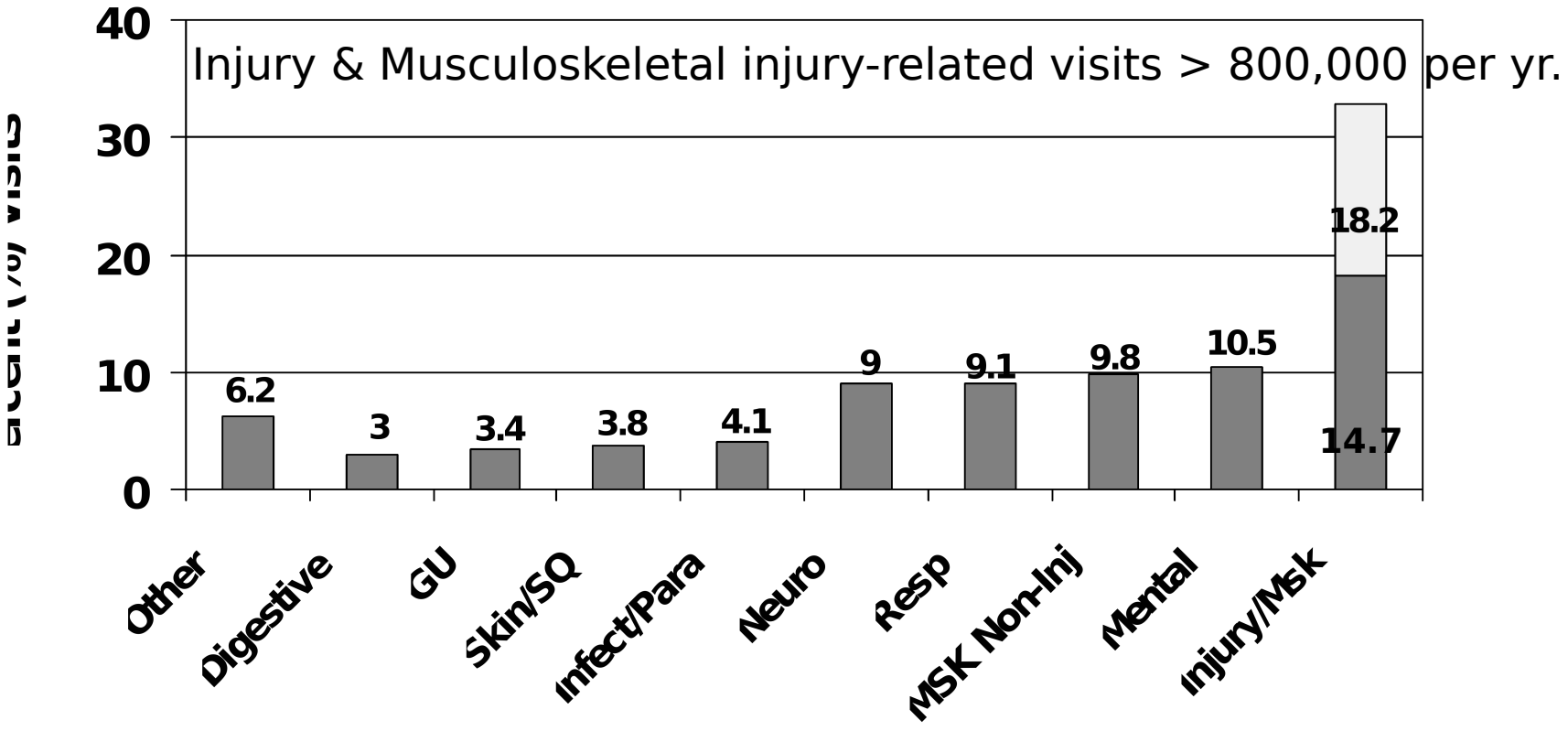
Total Number of Deaths = 427; CY 2002

Importance of Injuries vs. Illnesses as a Cause of Hospitalization in Soldiers, 2002



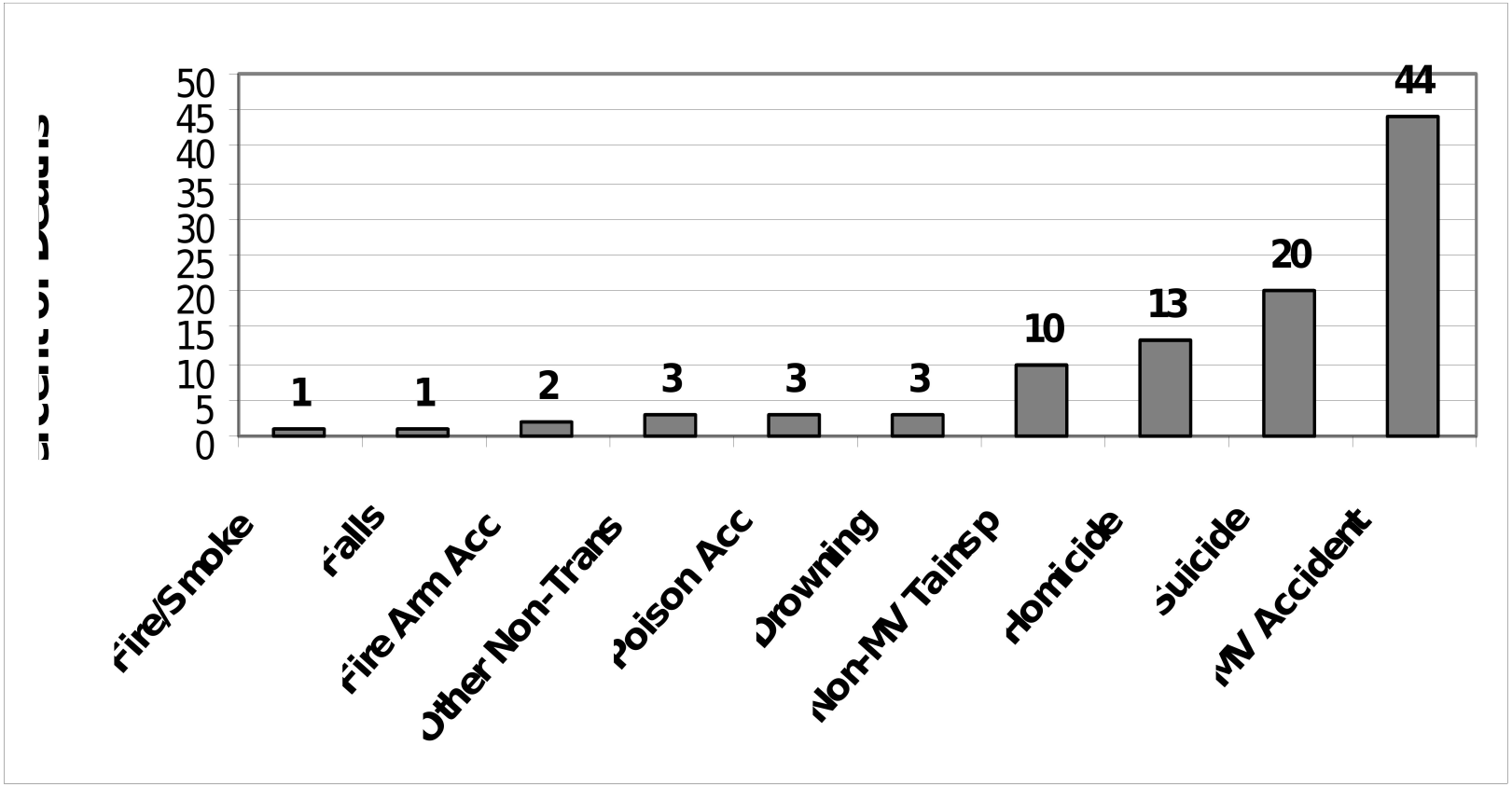
Total Number of Hospitalizations =72,104

Injuries vs. Illnesses Resulting in Outpatient Visits Among Soldiers, CY 2002



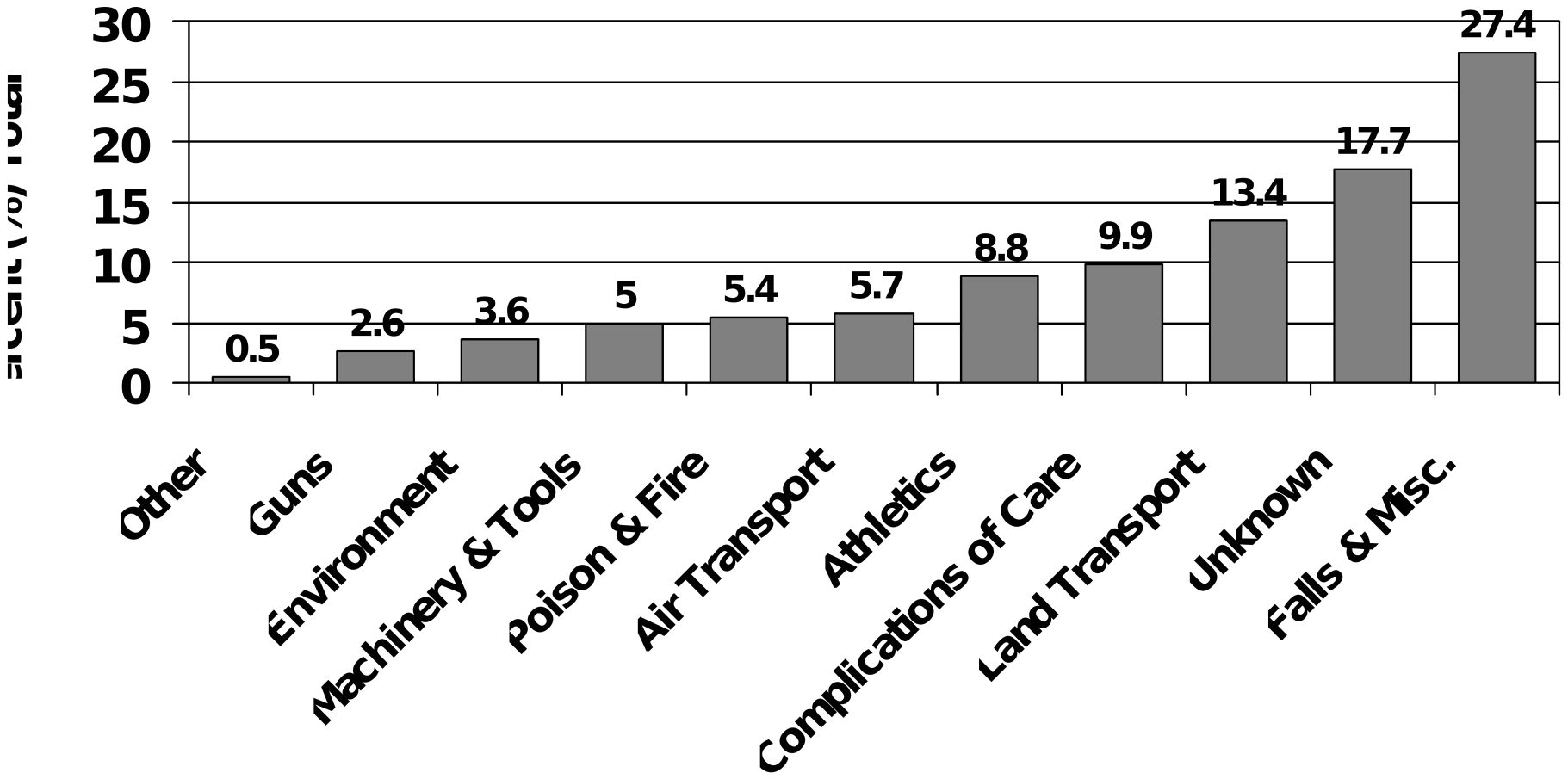
Total Outpatient Visits for Injury and Illness = 2,584,597

Causes of Injury Deaths Among Soldiers , CY 2001



Total Injury Deaths = 283 (does not include 8 cases due to undetermined causes)

Causes of Injuries Requiring Hospitalization of Soldiers, CY 2002*

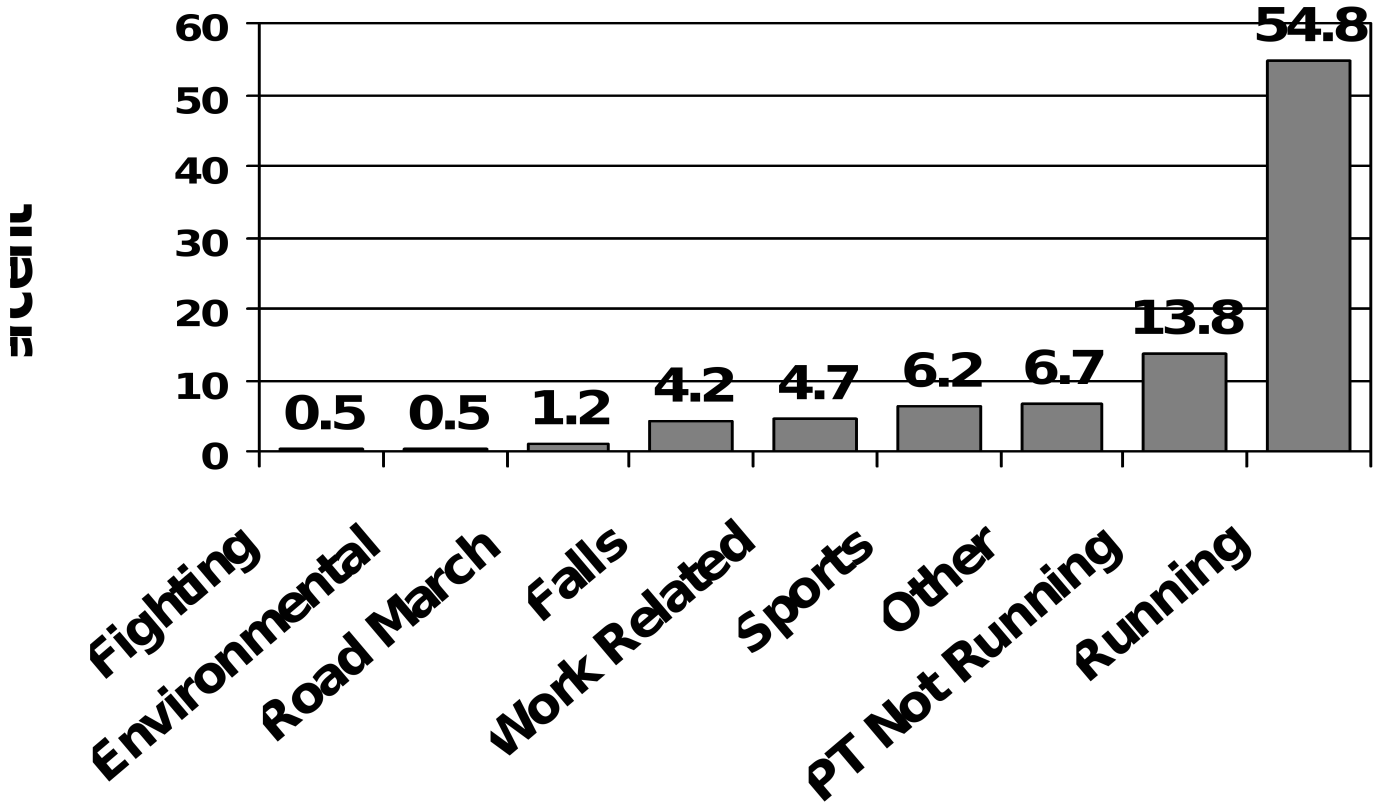


*Total Number = 4,594; Source from DMSS

USACHPPM Field Investigations, Evaluations and Recommendations

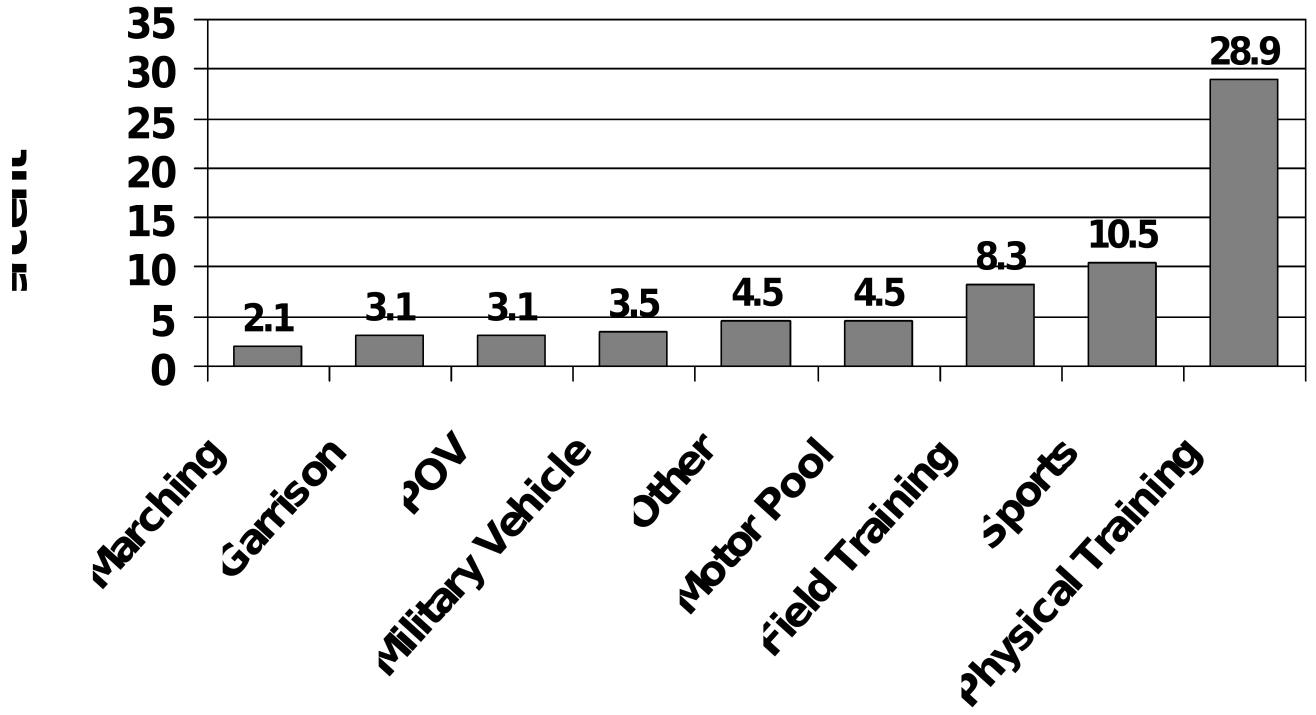
- Field investigations identifying problems & causes – Fort Leonard Wood, APG & Fort Riley
- Population based program evaluation determining if recommendations work
  - Ft Jackson PT Standardization - ↓ injuries while APFT scores stay the same with new training techniques
  - Army War College – ↓ injuries by educating on risks
  - Fort Drum, Footwear/Shoes - ↓ injuries with better matching of footwear to type of feet
- Scientific evidence-based recommendations for prevention – Reduced running mileage and PT Standards for BCT & AIT

Causes of Injuries Treated in Outpatient Clinics During AIT, APG, MD Jan 2000 – Mar 2002



Total # injury visits = 3106, % unknown = 7.5% (n=232),
From daily surveillance at KAHC

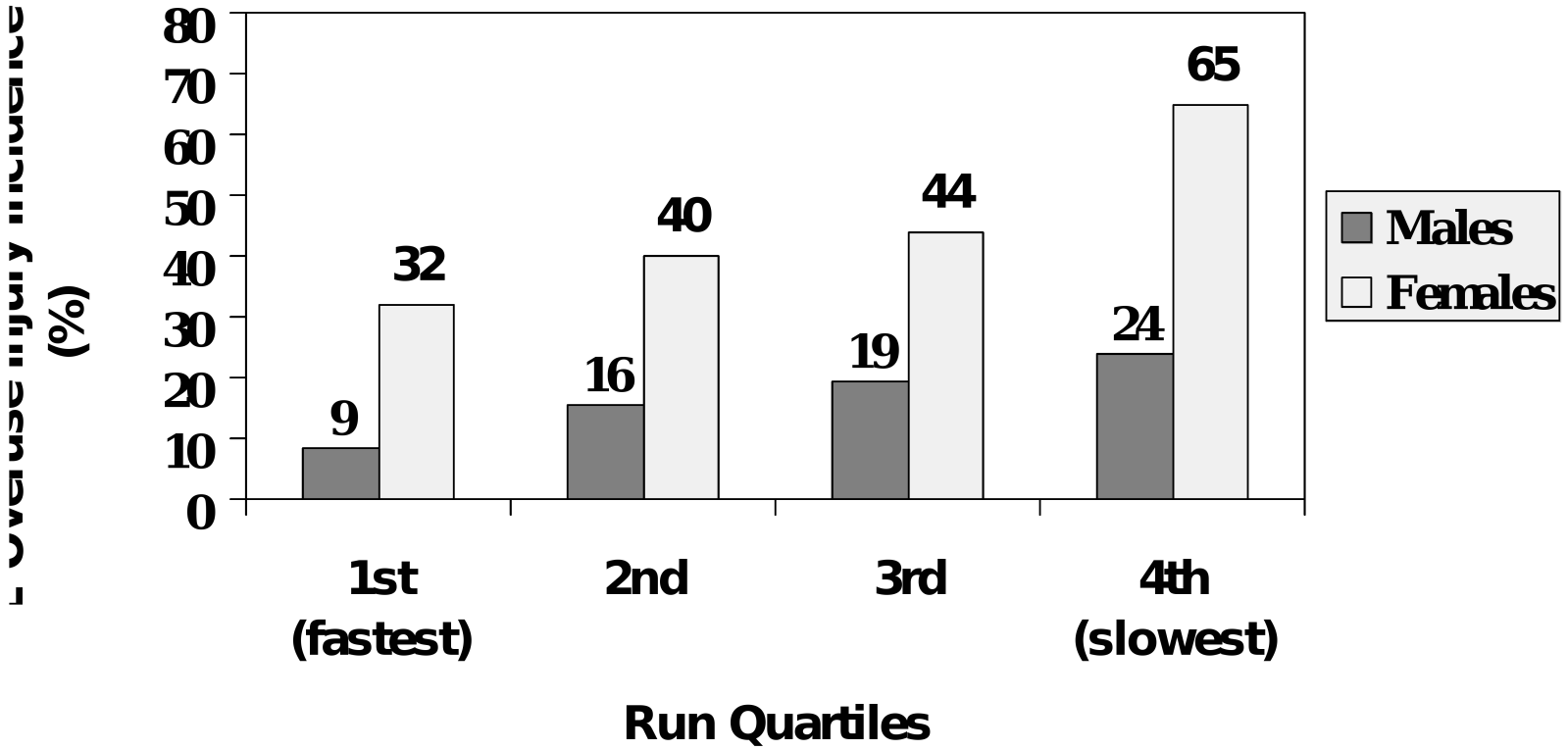
Causes of Outpatient Injury Visits Among Soldiers at Fort Riley, KS Apr 2001-Mar 2002



Total # injury visits = 1065, % unknown = 30% (n=320),

Total medical records reviewed = 768 soldier records

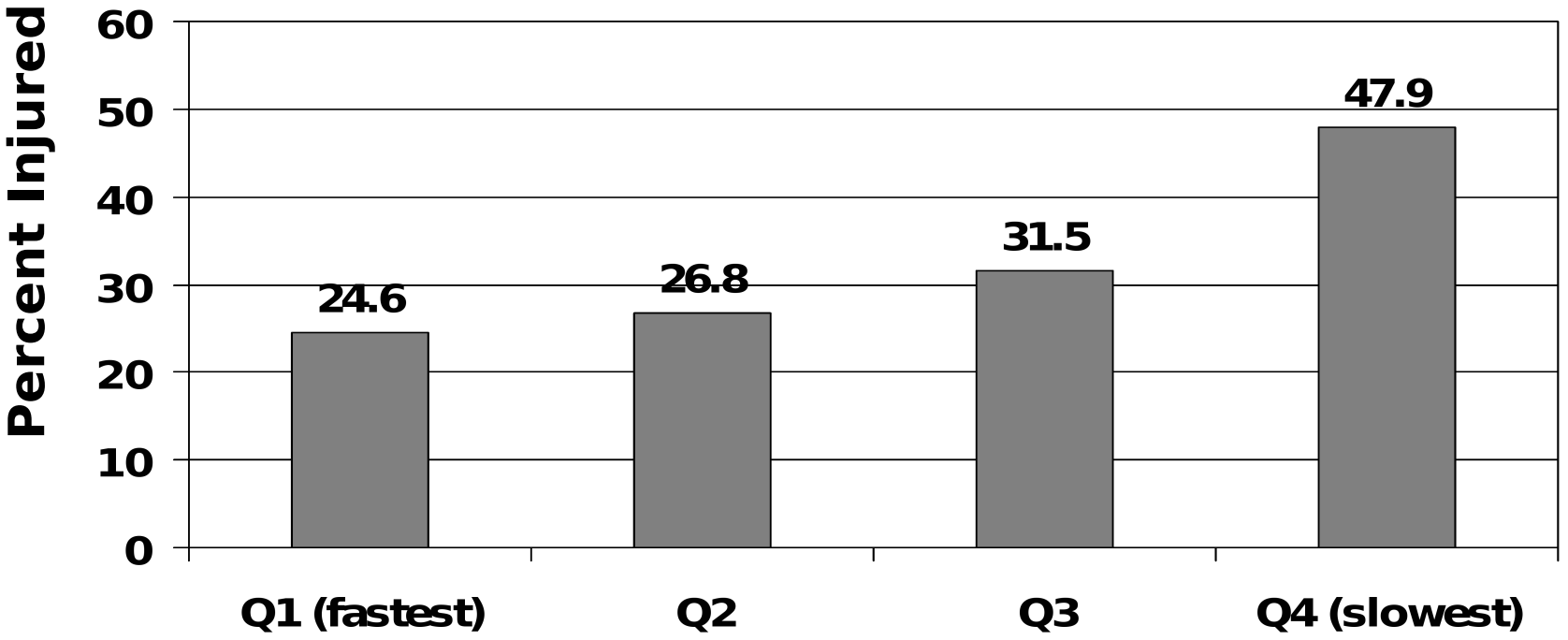
Association of Initial Run Time and LE Overuse Injury[a] BCT



RR Males: Q4/Q1 =2.81 p=<0.001; RR Females: Q4/Q1=2.03, p=<0.001

[a] Any LE overuse injury in the first 9 weeks of training IET, Ft Leonard Wood

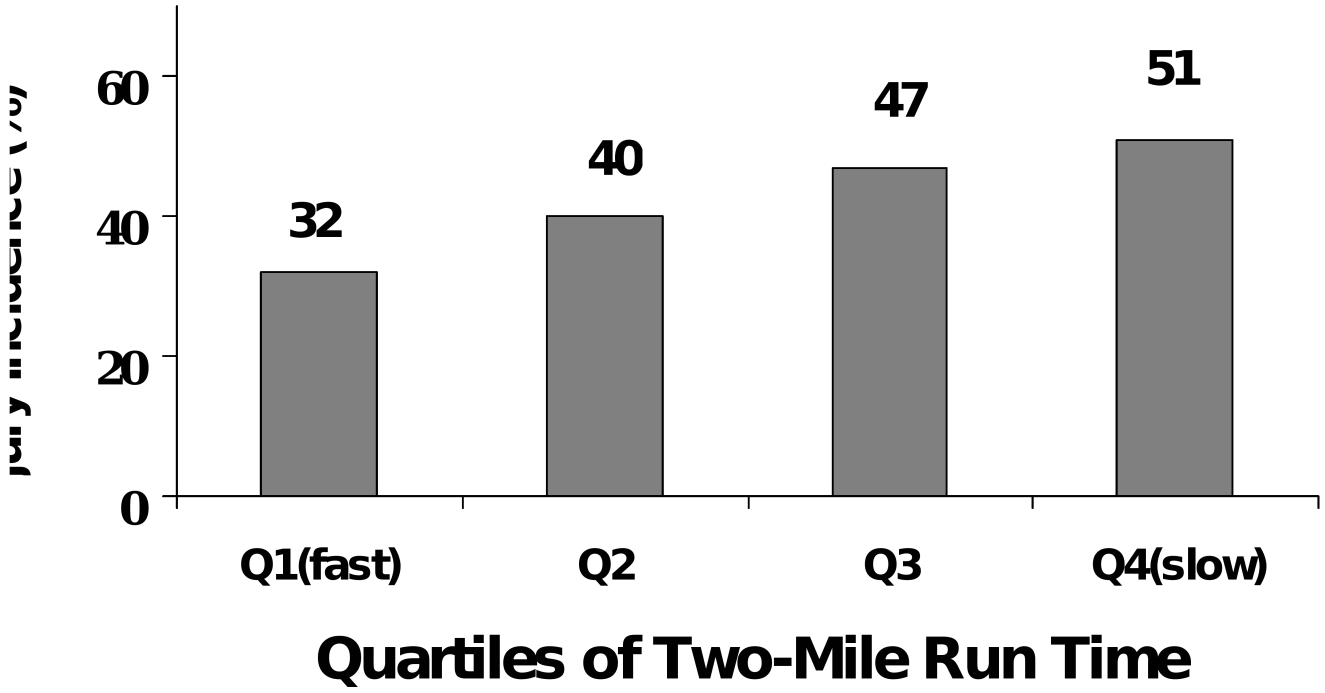
Injuries Among Males During AIT by APFT Run-time Quartiles APG, MD, 2001-2002



N = 2,657 Male Ordnance Center and School, AIT Trainees

Q1= 10.77-13.95 min, Q2=13.96-14.80, Q3=14.81-15.62, Q4=15.63-29.62

Injuries among Infantry Soldiers by Two-Mile Run Time, Fort Richardson



N=298 Light Infantry Soldiers (Ft Richardson, AK)
Risk Ratio (Q1/Q4)=1.6, p value (trend) <0.01
Knapik, J Occ Med 35:598, 1993
p-value for Trend: Men=0.03, Women=<0.01 (Ft Jackson, 1998)

Effects of High and Low Running Mileage on Injuries & Run Times During Infantry IET

Mileage*	Injury Incidence	Final APFT Avg 2 Mile Run Time
Low	41%	13:29
High	54%	13:45

* Miles run: Low = 60 miles/12 wks; High = 130 miles/12wks.

Effects of Running Mileage on Stress Fracture Incidence and Run Times Among Marine Recruits*

Test Group*	Miles Runs per 11 wks	% w Stress Fractures	3 Mile Run Times Avg
Control	55	3.7%	20:20
MCRD Cadre	41	2.7%	20:44
Test Exp Rec	33	1.7%	20:53

NHRC Trial 1995, San Diego MCRD; N = 3,350 (Control 1,136; Cadre 1,117; Test 1,0

TRADOC Program Implementation

- New policies & programs for PT being implemented by TRADOC
  - De-emphasize running; reduce miles run
  - Conduct distance runs by ability groups
  - Add speed drills
  - Balance PT program (e.g., substitute grass drills for running)
- Create Injury Advisory Committees
- Monitor injury rates and PT test scores

Effect of Standardized vs. Traditional PT Programs on Male Trainees Ft Jackson, 2003

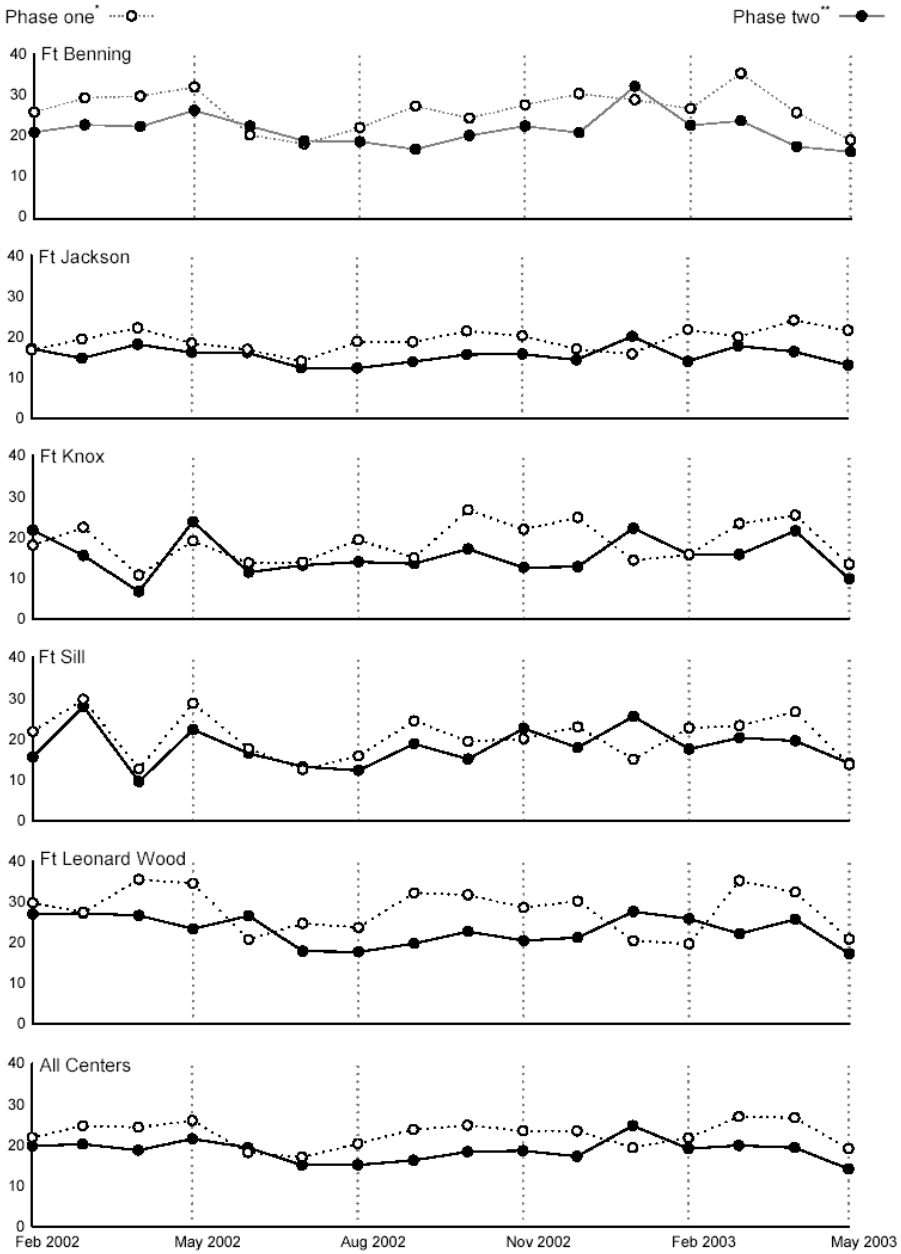
	Traditional PT*	Standardized PT*	Rate Ratio (95% CI)
Injury Rate (n/100)	31.3%	21.8%	1.4[a] (1.1-1.7)
APFT % Passing	84%	88%	0.9[b] (0.8-1.0)

* Traditional PT N=656; Standardized PT N=518

[a] p-value (trend): Injured Traditional/Standardized<0.001

[b] p-value (trend): % Passing APFT Traditional/Standardized=0.05

Training Related Injury Report for Army Basic Training Centers
Rate of New Injuries per 100 persons per month through May 2003



*Injury rate during training days 1 - 28
**Injury rate during training days 29 - 63
Note: Rates adjusted for winter holiday period

Report date: 4-June-03
Source: Defense Medical Surveillance Activity
Prepared by the Army Medical Surveillance Activity, USACHPPM

Four Steps of Public Health Approach to Injury Prevention

1. **Surveillance** – Identifies & prioritizes problems
2. **Research**
   - **Epidemiology - Finds causes and risk factors**
   - **Intervention Trials – Determine what works**
3. **Program and Policy Implementation** – Ensures action for prevention
4. **Evaluation** – Determines effectiveness

Keys to Successful Injury Prevention Process

- Use medical surveillance data to identify highest risk populations
- Target biggest, most serious and preventable problems for prevention
- Utilize proven, off-the-shelf, strategies where possible
- Evaluate programs and policies
- Use medical surveillance to monitor the effectiveness of programs